

S07/75-13-5-15/24

New Color Reactions on Ferricyanides

solution nearly all oxydants do not oxidize diphenylamine derivatives. The author of this paper investigated the sensitivity of the determination of ferricyanide ions in 5N NaOH according to the dropping test with the following diphenylamine carboxylic acids: Phenyl anthranilic acid, m-N-phenylamino-benzoic acid, o,o'-diphenylaminodicarboxylic acid and its m- and p-isomers, the three isomeric tolylanthranilic acids, o-methoxy-phenylanthranilic acid, o'- and p'-nitrophenylanthranilic acid, diphenylbenzidine-o,o'-dicarboxylic acid and diphenyltoluidine-o,o'-dicarboxylic acid. The sensitivity of the reactions with diphenyl-carboxylic acids decrease considerably with increasing alkali concentration. This effect becomes especially distinct in the o-nitrophenylanthranilic acid; for this acid therefore the sensitivity was determined in 0,1N NaOH. The investigated reagents formed with potassium ferricyanide in alkaline medium red-brown solutions with a maximum light absorption at 470 mμ. The investigations proved that the diphenylamine derivatives in alkaline solution are oxidized according to an analogous scheme as in acid solution: For the oxidation of an organic molecule two equivalents of the oxidizing agent are needed. The molar adsorption coefficients

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New Color Reactions on Ferricyanides

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of the oxidized solutions of o'-nitrophenylanthranilic acid and diphenyltoluidine-o,o'-dicarboxylic acid are given. The oxidation products of these two acids agree within a certain range of concentration with Lambert-Beer's law (the first between 10μ and 100μ /5 ml, the second between 30μ and 300μ /4 ml). This fact was used for the elaboration of a photometric method for the determination of traces of ferricyanide in potassium ferrocyanide. This method is precisely described. The synthesis of diphenyltoluidine-o,o'-dicarboxylic acid which has been carried out by the author for the first time, is also described. There are 3 figures, 3 tables, and 7 references, 4 of which are Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet (Saratov State University)

SUBMITTED: April 9, 1957

Card 3/4

5(2)

AUTHOR:

Frumina, N. S.

SOV/32-25-2-12/78

TITLE:

A Fast Method for the Determination of Iron in Cements
(Dystryy metod opredeleniya zheleza v tsementakh)

PERIODICAL:

Zavodskaya Laboratoriya, 1959, Vol 25, Nr 2, pp 148-149 (USSR)

ABSTRACT:

It is pointed out in several publications (Ref 1) that it is possible to titrate ferric salts with stannous salts in the presence of indigo carmine. Because of the low stability of the tin chloride solution this method is however not normally used. The color change of the indicator is very marked in these titrations, esp. in the presence of a major chloride surplus. It is recommended to add a surplus of ammonium chloride (Ref 2) and titrate at 70-80° and an acidity corresponding to a 5 n hydrochloric acid solution. This method was tested in the present case with solutions of pure iron salts (Table 1) and developed as to be applicable for the fast determination of iron in cements. An analysis process is described. A SnCl_2 surplus is back titrated with potassium bichromate, the indicator being phenyl anthranilic acid. The results of the analyses of samples of filling, portland, and

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A Fast Method for the Determination of Iron in
Cements

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puzzolane cement are given (Table 2). Duration of the
analysis: 10-12 min. There are 2 tables and 2 references,
1 of which is Soviet.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet im. N. G. Cherny-
shevskogo (Saratov State University imeni N. G. Cherny-
shevskiy)

Card 2/2

69049

5.2620

AUTHORS:

Mustafin, I. S., Frumina, N. S.S/078/60/005/03/011/048
B004/B002

TITLE:

The Complex¹ of Dimethyl Glyoxime¹ With Tetravalent Nickel

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1960, Vol 5, Nr 3, pp 571-574 (USSR)

ABSTRACT:

The authors give a survey of papers published in the field of structural research concerning nickel and dimethyl glyoxime compounds, and they quote A. K. Babko (Ref 3), A. S. Andreyev et al. (Ref 6), V. M. Peshkova, and N. V. Mel'chakova (Ref 7). They investigated the reaction of the hydrate of Ni^{II} oxide with dimethyl glyoxime under the addition of different oxidizing agents (Table 1), determined the amount of active oxygen, and found out that the amount of iodine liberated by active oxygen, stoichiometrically corresponds to the content of Ni^{IV} in the specimen (Table 2). Independently of the valence of the nickel contained in the specimen, always the same compound develops, as was shown by the light absorption curve (Fig), i.e. either by reaction of Ni^{IV} contained in the specimen, or due to oxidation of Ni^{II} into Ni^{IV} by active oxygen contained as a solid solution in the nickel oxide concerned. The possibility of such an oxidation is confirmed by K. B. Yatsimirskiy's and Z. M. Grafova's papers (Ref 5). The authors also point at the fact that Fe^{II} , which also forms a soluble complex with dimethyl glyoxime,

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69049

The Complex of Dimethyl Glyoxime With Tetravalent Nickel S/078/60/005/03/011/048
B004/B002

is of the same electron structure as Ni^{IV} (Table 3). Therefore they arrived at the conclusion that the red soluble complex of dimethyl glyoxime with nickel is a compound of Ni^{IV} . There are 1 figure, 3 tables, and 14 references, 11 of which are Soviet.

SUBMITTED: November 22, 1958

Card 2/2

S/032/60/026/04/03/046
B010/B006

AUTHORS: Mustafin, I. S., Frumina, N. S.

TITLE: Determination of Active Oxygen in Loaded Powder-metallurgical
Nickel Electrodes \

PERIODICAL: Zavodskaya laboratoriya, 1960, Vol. 26, No. 4, pp. 410 - 412

TEXT: A method for deposition and determination of active oxygen in powder-metallurgical nickel electrodes was developed. Tartaric acid, oxalic acid, sodium arsenite, and salts of trivalent chromium were tested as reducing agents. The chromium salts applied in concentrated alkali solution at boiling point, proved most suitable. An amount of chromate equivalent to that of the nickel oxide present is formed (in 30-40 min) and determined iodometrically or by titrating with Mohr's salt using phenyl anthranilic acid as indicator. The analytical data of some powder-metallurgical electrodes are tabulated. Tests carried out with samples admixed with finely dispersed metallic nickel showed, that during the analysis according to the chromate method described above no oxygen is lost (by reaction with metallic nickel. The procedure is given. There is 1 table.

Card 1/2

FRUMINA, N.S.

Diphenylaminecarboxylic acids as reagents for the photometric determination of oxidizers. Trudy kom. anal. khim. 11:120-136 '60.
(MIRA 13:10)

1. Nauchno-issledovatel'skiy institut khimii pri Saratovskom gosudarstvennom universiteta.
(Anthranilic acid) (Oxidizing agents)

MOLOT, L.A.; MUSTAFIN, I.S.; FRUHINA, N.S.

Comparison of the methods of determining trace amounts of
aluminum with organic reagents. Trudy kon. anal. khim. 11:231-242
'60. (MIRA 13:10)

1. Nauchno-issledovatel'skiy institut khimii pri Saratovskom
gosudarstvennom universitete.
(Aluminum--Analysis)

MOLOT, L.A.; FRUMINA, N.S.

Determination of beryllium traces in a mixture of calcium,
strontium, and barium carbonates. Uch.zap. SGU 75:90-95
'62. (MIRA 17:3)

BADAYEVA, T.I.; MOLOT, L.A.; FRUMINA, N.S.; FRUMINA, K.G.
APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000513820005-7"

Rapid methods for determining aluminum, iron, and calcium in
slimes. Uch.zap. SGU 75:100-102 '62. (MIRA 17:3)

MUSTAFIN, I.S.; FRUMINA, N.S.; AGRANOVSKAYA, L.A.

Determination of gold in tungsten-based platings by means
of variamine blue. Zhur. anal. khim. 18 no.9:1054-1058
S '63. (MIRA 16:11)

1. N.G. Chernyshevsky Saratov State University.

MUSTAFIN, I.S.; FRUMINA, N.S.; CHUGREYEVA, N.V.

"Chemical analysis of industrial waste waters" by IU.IU.Lur'e, A.I.
Rymnikova. Reviewed by I.S.Mustafin, N.S.Frumina, N.V.Chugreeva.
Zav.lab. 29 no.12:1509 '63. (MIRA 17:1)

FRUMINA, N.S.; GORYUNOVA, N.N.; MUSTAFIK, I.S.

Spectrophotometric study of bis-(4-sodium-5-tetrazolylazo)-ethyl
acetate in aqueous solutions. Zhur. anal. khim. 21 no. 1:7-12
'66 (MIRA 19:1)

1. Saratovskiy gosudarstvennyy universitet imeni Chernyshevskogo.

POZDNYAKOV, A.A., dots., kand. tekhn. nauk; FRUMINA, J.I.,
st. prepod.

[Design of thin-walled vessels; a textbook for students
of chemical departments] Raschet tonkostennykh sosudov;
uchebnoe posobie dlia studentov khimicheskikh fakul'te-
tov. Krasnoiarsk, 1963. 32 p. (MIRA 17:9)

1. Krasnoyarsk. Sibirskiy tekhnologicheskii institut.
Kafedra soprotivleniya materialov.

FRUMKIN, A., kand.ekonom.nauk

Bourgeois theories of trade blocks. Vnesn. torg. 42 no.9:15-24
'62. (MIRA 15:9)

(Europe, Western--Economic Policy)

ROGINSKIY, G., prof.; FRUMKIN, A., dotsent

Is there a "rational kernel" in the bourgeois theory of foreign
trade? On the theory of comparative production costs. Vnesh.
torg. 41 no.11:20-31 '61. (MIRA 14:11)
(Commerce) (Division of labor)

8(0)

SOV/112-59-1-1038

Translation from: Referativnyy zhurnal. Elektrotehnika, 1959, Nr 1,
pp 137-138 (USSR)

AUTHOR: Donskoy, A. V., and Frumkin, A.

TITLE: High-Frequency Welding of Polyvinyl-Chloride Cable Sheath

PERIODICAL: V sb.: Prom. primeneniye tokov vysokoy chastoty. Riga, 1957,
pp 365-374

ABSTRACT: A polyvinyl-chloride plastic in the form of a calendered tape is laid by some means on a cable and the tape edges are welded, under suitable pressure, by heating in a UHF field. The optimum field parameters (strength and frequency) ensure a welding speed consistent with the required cable feed rate and good quality of weld. A principal circuit diagram of the UHF outfit is presented and examined in detail; the outfit was tested in a laboratory and in tentative production. Both spiral and longitudinal vinyl-tape laying methods have been tested. The tests have confirmed both in principle and in practice

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SOV/112-59-1-1038

High-Frequency Welding of Polyvinyl-Chloride Cable Sheath

the possibility of a continuous welding of both the spiral and longitudinal cable-sheath vinyl tapes by dielectric heating. The longitudinal method is simplest and lowest in cost. It has produced a seam of an entirely satisfactory quality. The weld-seam strength is now lower than that of the solid tape. The maximum cable feed rate for the spiral method is 5 m/min and for the longitudinal, 10 m/min.

I.N.G.

Card 2/2

FRUMKIN, A.

Ten days in Finland. Vnesh. torg. 30 no.12:23-25 '60.

(MIRA 13:12)

(Finland—Description and travel)

FRUMKIN, A.

History and the present. Vnesh. torg. 41 no.1:19-20 '61.
(MIRA 1441)
(Russia--Foreign economic relations)

FRUMKIN, A. A.

USSR/Engineering
Tempering
Heating, Electric

Apr 49

"Power Indexes of High-Frequency Equipment for Dielectric Heating(Tempering)," Docent A. V. Donskoy, S. M. Kulyashov, Cand Tech Sci, A. A. Frumkin, Engr, 3 pp

"Prom Energet" No 4

Problem of applying dielectric method of heating (tempering) as a technological process in industry must be solved separately in each case, with computation of all indexes involving technology, energy, and efficiency. Discusses different technological tasks involving tempering of materials in high-frequency fields, according to which the power necessary for technological objectives will be relatively different. Gives two tables of experimental results.

PA 40/49T49

1ST AND 2ND EDITIONS										3RD AND 4TH EDITIONS									
PROCESSING AND PROPERTY INDEX																			
<div style="position: relative;"> <div style="position: absolute; top: 10px; left: 10px; font-size: 2em; font-weight: bold;">FRANKIN, A.A.</div> <div style="position: absolute; top: 10px; left: 10px; font-size: 2em; font-weight: bold;">p/c</div> <div style="position: absolute; top: 10px; right: 10px; font-size: 2em; font-weight: bold;">B2</div> <div style="position: absolute; top: 10px; right: 10px; font-size: 2em; font-weight: bold;">6</div> <div style="position: absolute; top: 200px; left: 200px; width: 80%; text-align: center;"> <p>Routing of a path in a high-frequency electric field. A. V. Donohoy and A. A. Frankin (<i>Trans. from</i>, 1948, No. 11, 48-44).—A description is given of the results of small-scale experiments on the high-frequency drying of wood after drying. The packages are placed between horizontal endboard plates and laminated from the center on each side by a layer of plywood. On the laboratory scale with a frequency of 2 megacycles, drying was complete in 1-5 hr. On the semi-production scale with a frequency of 0.2-0.3 megacycles, with circulation of air preheated to 90°, 2-3 hr. were needed to dry 60 kg. of pulp. E. B. Uvanov.</p> </div> </div>																			
ASS-156 METALLURGICAL LITERATURE CLASSIFICATION										62-156.12.11									
1ST EDITION										2ND EDITION									
1ST EDITION										2ND EDITION									

FRUMKIN, A. A., Engr

USSR/Electronics - Induction Furnaces

Dec 50

"Utilization of Thermal Energy Loss in High-Frequency Electrothermal Installations,"
A. V. Donskoy, Cand Tech Sci, A. A. Frumkin, Engr

"Prom Energet" No 12, p 8

Present hf electrothermal equipment with vacuumtube oscillators shows losses of 45-70T. Author suggest that thermal energy from water and air employed in cooling operations could be utilized by industrial enterprises to effect substantial savings.

PA 213T50

FRUMKIN, A.A.

AID P - 1190

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 12/27

Authors : Donskoy, A. V., Kand. of Tech. Sci. and Frumkin, A. A., Eng.

Title : Economizing electric power in the operation of high-frequency electrothermic installations

Periodical : Energetik, 12, 14-16, D 1954

Abstract : The authors suggest a new design of an arrangement for case hardening and for melting metals, which, according to their experience, provides considerable economy in power consumption. Two diagrams, 1 table.

Institution : None

Submitted : No date

FRUMKIN, A. A.

AID P - 647

Subject : USSR/Electricity

Card 1/1 Pub. 27 - 16/34

Authors : Donskoy, A. V., Dr. of Tech. Sci., and Frumkin, A. A.,
Eng., Leningrad

Title : Centralized feeding of induction heaters from vacuum tube
oscillators

Periodical : Elektrichestvo, 9, 70-74, S 1954

Abstract : The problem of feeding several induction heating instal-
lations is discussed. Several circuit diagrams and in-
stallation layouts are investigated. 7 drawings, 3 ref-
erences (1946-1949).

Institution : Leningrad Polytechnical Institute im. Kalinin and
"Sevzappromelektropech'"

Submitted : Ap 22, 1954

FRUMKIN, I. I.

DONSKOY, A.V.; IVENSKIY, G.V.; FRUMKIN, A.A.

Large-capacity electromagnetic voltage stabilizers. [Izd.]
LONITOMASH no.33:299-312 '54. (MIRA 8:2)
(Voltage regulators)

FRUMKIN, A.A.
DONSKOY, A.V.; FRUMKIN, A.A.

New design of electrodes for dielectric contact heating. [Izd.]
LONITOMASH no.33:274-282 '54. (MLRA 8:2)
(Electrodes)(Dielectric heating)

DONSKOY, A.V., doktor tekhnicheskikh nauk, professor; FRUMKIN, A.A.,
inshener.

Standards for maximum allowable industrial interference. Vest.
elektroprom. 27 no.11:54-56 M '56. (MLRA 9:12)

1. Leningradskiy politekhnicheskii institut (for Donskoy).
2. Leningradskiy zavod vysokochastotnykh ustanovok (for Frum-
kin).

(Radio--Interference)

DONSKOY, A.V., doktor tekhnicheskikh nauk, professor; FRUMKIN, A.A.,
inzhener.

Using dielectric heating to dry capacitor paper in rolls.
Vest.elektroprom. 27 no.5:35-39 My '56. (MIRA 9:12)

1. Leningradskiy politekhnicheskoy institut imeni M.I. Kalinina
(for Donskoy) 2. Sevsappromelektropech' Ministerstva elektricheskoy
promyshlennosti.
(Dielectric heating) (Condensers (Electricity)--Drying)

AUTHOR: Frumkin, A.A., Laboratory Head SOV/144-59-10-3/20

TITLE: Computation of the Capacitor Impedance under Dielectric Heating
of Certain Products

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika,
1959, Nr 10, pp 16 - 24 (USSR)

ABSTRACT: For the high-frequency valve generator of an induction heating equipment to work efficiently, the parameters of the circuit must match the valve characteristics. It is, therefore, important to be able to calculate the impedance of the material being heated, which, in effect, forms a capacitor and is an important component of the oscillatory circuit of the generator. The complex impedance of a capacitor is given by expression (1), in which the complex capacitance is calculated from the complex permittivity and makes allowance for the loss angle of the material. The problem thus consists of determining the complex capacitance of the capacitor containing the product to be heated. If the capacitor is not of very simple geometry, special methods suited to each particular case must be used to calculate

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Computation of the Capacitor Impedance under Dielectric
Heating of Certain Products

the capacitance. Two typical practical cases are then considered: one is the case of material wound in an insulating cylinder and the other that of a heavy tyre being pre-heated before vulcanisation. It is assumed that the dimensions of the product are much smaller than the oscillator wavelength and that heat losses by external radiation may be neglected. No allowance is made for changes in the electrical properties of the material during the process of heating.

Insulating cylinders are heated capacitatively in the manner illustrated diagrammatically in Figure 1. A metal form fitting inside the cylinder serves as one electrode and the cylinder rotates around its axis under an external electrode which covers part of the cylinder surface. As the cylinder rotates its whole volume is gradually heated up to the required temperature. For the sake of simplicity, the external electrode is considered as being terminated by an arc of such a radius that its straight-line sections are tangential, as indicated in

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Computation of the Capacitor Impedance under
Dielectric Heating of Certain Products

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Figure 2. The problem may be considered as plane-parallel, as the length of the cylinder is much greater than its diameter. The total capacitance of the system is then calculated as the sum of three parts and is given by Eq (21), the effective ohmic resistance being expressed by Eq (22).

According to published data, at a frequency of 5 Mc/s and room temperature, phenol-formaldehyde varnished tubes containing 30-32% of resin have a permittivity of 3.7 and a power factor of 0.038. Changes in these values during the process of heat treatment are plotted in Figure 3. It has been found that in the frequency range of 5 - 20 Mc/s, there is little variation in the permittivity and power factor of this material. Calculated values of capacitance and ohmic resistance per unit length of tube as a function of the angle of arc covered by the outer electrode and of the ratio of outer to inner radius of the cylinder are plotted in Figure 4 and relate to a

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Computation of the Capacitor Impedance under
Dielectric Heating of Certain Products

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frequency of 20 Mc/s. These curves may be used for practical calculations, the resistance at other frequencies being obtained from Eq (22). It will be seen that in Figure 4 the experimental points lie close to the theoretical curves. Typical changes in the parameters per unit time during the process of heating a tube are calculated from the curves of Figure 3 and the formulae derived and are plotted in Figure 5. Heavy tyres are heated in a cylindrical capacitor, whose inner electrode is a metal binding carrying the rubber tyre. In this case, the length of the capacitor is commensurate with the distance between the plates and so the usual formula for a long cylindrical capacitor cannot be used. In order to calculate the edge effect, the capacitor is assumed to be cut along the generating lines and developed in a plane. The error so introduced depends on the ratio of the diameters of the capacitor plates, as shown in the graph of Figure 7. If this ratio is less than 1.8, the error is less than 3%; and for heavy tyres, where the ratio is about 1.2, the error is not greater

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than 0.2%. Then the length of the equivalent plane capacitor is given by Eq (23) and the distance between the plates by Eq (24). The field intensity at the edge of the plane capacitor is given by Eq (25). Finally, Eq (33) is derived for the complex capacitance of the tyre considered as a capacitor. For capacitors of the usual proportions, this formula may be greatly simplified to expression (34).

A numerical example of the calculation of the characteristics of a capacitor formed by a heavy tyre is then worked out. There are 9 figures and 6 Soviet references.

ASSOCIATION: Leningradskiy politekhnicheskii institut (Leningrad
Polytechnical Institute)

SUBMITTED: May 30, 1959

Card 5/5

S/196/62/000/010/032/035
E194/E155

AUTHORS: Frumkin, A.A., and Senderikhin, I.M.

TITLE: High-frequency valve equipments for heating, welding and sealing non-conducting materials

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.10, 1962, 16, abstract 10 K86. (In the Symposium 'Vysokochastotn. elektrotermich. ustanovki' (High-frequency Electro-thermal Installations), M.-L., Gosenergoizdat, 1961, 62-76).

TEXT: Leningrad TsKB UVU has developed and the LZVU has made two new types of comparatively high-power equipment: ЛГД-32 (LGD-32) of 30 kW and ЛГД-62 (LGD-62) of 60 kW. The equipments can be used without much reconstruction for a wide range of manufacturing processes. The same organizations have also produced two types of equipment for compression welding of film materials: ЛГС-1.5 (LGS-1.5) and ЛГС-0.6 (LGS-0.6), of 1.5 and 0.6 kW respectively. The range of welding equipment will be continuously extended. In particular, low-power equipment (250 W) will be developed in two forms: with a press and with Card 1/2

High-frequency valve equipments ... S/196/62/000/G10/032/035
E194/E155

tongs. Installations of 2.5 kW and more are being developed. To meet industrial requirements in 1960 the TsKB UVU developed two new types of equipment: ЛГД 1-2 (LGD 1-2) of 1.6 kW and ЛГД 1-4 (LGD 1-4) of 4 kW for the preheating of press materials. In 1960 the high-frequency equipment type ЛГД-10А (LGD-10A) was reconstructed and renamed ЛГД-12 (LGD-12). By using a more powerful tube type ГУ-10 (GU-10A), the a.c. power was increased from 8 to 10 kW. Simultaneously, TsKB UVU is developing a series of special equipments for glueing wood, with outputs of 2.5, 6, 10, 25 and 60 kW. Special equipment is being developed for service in rotor lines used in the manufacture of plastic products. Equipment is being developed for high-speed cooking of food. The range of equipment for welding plastic films will be extended. Circuit diagrams and photographs of the equipments are given and their operation is briefly described.

Abstractor's note: Complete translation.
Card 2/2

SHCHERBAKOVA, Yu.I.; FRUMKIN, A.A.

Circuit analysis of a low-frequency self-oscillator with
distributed parameters. Izv.vys.ucheb.zav.; elektromekh. 7
no.11:1386-1389 '64. (MIRA 18:3)

DONSKOY, A.I.V., doktor tekhn. nauk, prof.; DONSKOY, An.V.;
DRESVIN, S.V.; IVENSKIY, G.V.; KUKHTIN, A.M.; LEYBIN,
Yu.V.; MONDRUS, D.B.; SOLOMAKHIN, I.M.; FRUMKIN, A.A.;
BALASHOV, V.A., retsenzent

[High-frequency electrothermy; a handbook] Vysokochastot-
naia elektrotermia; spravochnik. Moskva, Mashinostroenie,
1965. 564 p. (MIRA 18:6)

FRUMKIN, A.B.

ABRAMOV, V.A.; ALEKSEYEV, A.M.; AL'TER, L.B.; ARAKELYAN, A.A.; BAKLANOV, G.I.;
 BASOVA, I.A.; BLYUMIN, I.G.; BOGOMOLOV, O.T.; BOR, M.Z.; BREZEL',
 E.Ya.; VEYTSMAN, N.R.; VIKENT'YEV, A.I.; GAL'TSOV, A.D.; GERTSOVSKAYA,
 B.R.; GLADKOV, I.A.; DVORKIN, I.N.; DRAGILEV, M.S.; YEFIMOV, A.N.;
 ZHAMIN, V.A.; ZHUK, I.N.; ZAMYATNIN, V.N.; IGNAT'YEV, D.I.; IL'IN,
 M.A.; IL'IN, S.S.; IOFFE, Ye.A.; KAYE, V.A.; KAMENITSER, S.Ye.;
 KATS, A.I.; KLIMOV, A.G.; KOZLOV, G.A.; KOLGANOV, M.V.; KONTOROVICH,
 V.G.; KRAYEV, M.A.; KRONROD, Ye.A.; LAKHMAN, I.L.; LIVANSKAYA, F.V.;
 LOGOVINSKAYA, R.L.; LYUBOSHITS, L.I.; MALYSH, A.I.; MENZHINSKIY,
 Ye.A.; MIKHAYLOVA, P.Ya.; MOISEYEV, M.I.; MOSKVIN, P.M.; NOTKIN,
 A.I.; PARTIGUL, S.P.; PERVUSHIN, S.P.; PETROV, A.I.; PETRUSHOV, A.M.;
 PODGORNNOVA, V.M.; RABINOVICH, M.A.; RYVKIN, S.S.; RYNDINA, M.N.;
 SAKSAGANSKIY, T.D.; SAMSONOV, L.N.; SMEKHOV, B.M.; SOKOLIKHIN, S.I.;
 SOLLERTINSKAYA, Ye.I.; SUDARIKOV, A.A.; TATAR, S.K.; TERENT'YEV,
 P.V.; TYAGAY, Ye.Ya.; FEYGIN, Ye.G.; FIGURNOV, P.K.; FRUMKIN, A.B.;
 TSYRLIN, L.M.; SHAMBERG, V.M.; SHAPIRO, A.I.; SHCHENKOV, S.A.;
 EYDEL'MAN, B.I.; KKHIN, P.E.; MITROPANOVA, S., red.; TROYANOVSKAYA, N.,
 tekhn.red.

[Concise dictionary of economics] Kratkii ekonomicheskii slovar'.
 Moskva, Gos.izd-vo polit.lit-ry, 1958. 391 p. (MIRA 11:7)
 (Economics--Dictionaries)

MALAKHOVSKIY, Ya.E.; IVANOV, Yu.B.; DYBOV, O.V., kandidat tekhnicheskikh nauk, redaktor; ~~FRUMKIN, A.K.~~, kandidat tekhnicheskikh nauk, dotsent, retsenzent; KOTIKOV, A.K., inzhener, retsenzent; SOKOLOVA, T.F. tekhnicheskii redaktor.

[Automobile fiction clutches] Friksionnye stsepleniia avtomobilei. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1955. 142 p. (Razvitie konstruktii avtomobilei, no.13) (MLRA 8:8)
(Automobiles--Clutches)

MALAKHOVSKIY, Yakov Emmanuilovich; LAPIN, Aleksandr Al'bertovich;
ZILOV, A.L., retsenezent; LIPGART, A.A., prof., red.; FRUMKIN,
A.K., red.; MARTENS, S.L., red.isd-va; UVAROVA, A.F., tekhn.red.
[Clutches] Stseplenii. Pod obshchei red. A.A.Lipgarta. Moskva,
Gos.nauchno-tekhn.isd-vo mashinostroitel'ny, 1960. 191 p.
(Motortrucks--Clutches) (MIRA 13:5)

DYMSHITS, Ioann Iosifovich; LIPGART, A.A., prof., doktor tekhn.nauk,
red.; FRUMKIN, A.K., red.; MODEL', B.I., tekhn.red.

[Gearboxes] Korobki peredach. Pod red. A.A.Lipgarta. Moskva,
Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 359 p.
(MIRA 13:7)

(Automobiles--Transmission devices)

LITVINOV, A.S.; ROTENBERG, R.V.; FRUMKIN, A.K.; FAL'KEVICH, B.S.,
doktor tekhn. nauk, retsenzent; PETROV, V.A., kand. tekhn.
nauk, retsenzert; VOLKOV, P.M., doktor tekhn nauk;
YEGORKINA, L.I., red.izd-va; MODEL', B.I., tekhn. red.

[Motor-vehicle chassis; construction and elements of design]
Shassi avtomobilia; konstruktsiia i elementy rascheta. Mo-
skva, Mashgiz, 1963. 502 p. (MIRA 16:12)
(Motor vehicles—Design and construction)

BELEN'KIY, Yu.B.; DRONIN, M.I.; METLYUK, N.F.; FRUMKIN, A.K.,
doktor tekhn. nauk, prof., ratsenzent

[New developments in the design and construction of
motor-vehicle brakes] Novye v raschete i konstruktsii
tormozov avtomobilei. Moskva, Mashinostroenie, 1965.
118 p. (MIRA 18:7)

FRUMKIN, A. L.

USSR/ Physics - Metallurgy

Card 1/1 Pub. 43 - 14/15

Authors : Frumkin, A. L., and Kholodnyy, S. D.

Title : Measurement of thermal dependence of the electrical resistance of Ni-Zn-ferrites

Periodical : Izv. AN SSSR. Ser. fiz. 18/3, 409-411, May-Jun 1954

Abstract : It was established that the electrical resistance of ferrites depends upon their composition, methods of calcination and cooling and upon the medium in which thermal treatment is carried out. The electrical resistance of Ni-Zn-ferrites is considered a very important characteristic since it determines the losses due to eddy currents. It was found that any reduction in the FeO amount leads to a reduction in ferrite resistance. Rapid cooling results in the formation of ferrites of low specific resistance and low activation energy; the activation energy and the electrical resistance may

Izv. AN SSSR. Ser. fiz. 18/3, 409-411, May-Jun 1954

(Additional Card)

Card 2/2

Abstract : decrease by one half in comparison with samples of the very same composition which were slowly chilled. The exponential nature of the relation between resistance and temperature at a wide range of temperatures is explained. Four references : 2 USSR; 1 French and 1 USA (1951 and 1952).

Institution : The V. M. Molotov Electrical Engineering Institute, Moscow

Submitted : May 16, 1954

FRUMKIN, A. L.

- ✓ 4815. SOME PROBLEMS IN THE THEORY OF THE REMOVAL OF FLYING DUST FROM
MINE AIR BY SPRAYING. Frumkin, A. L. (Izv. Akad. Nauk SSSR, Otdel. Tekh.
Nauk (Bull. Acad. Sci. U.S.S.R., Sect. Tech. Sci.), Nov. 1955, 129-134).
- 62 Formulas are derived for the action of water sprays on dust in suspension.
One conclusion is that water sprays are ineffective against particles with
radii of 2 microns or less. It is suggested that the drops of water in the
sprays should be electrically charged.

112-57-7-13954

Translation from: Referativnyy zhurnal, Elektrotehnika, 1957, Nr 7, p 17 (USSR)

AUTHOR: Frumkin, A. L., and Kholodnyy, S. D.

TITLE: On the Problem of Ferrite Permittivity in a Low-Frequency Band
(K voprosu o dielektricheskoy pronitsayemosti ferritov v nizkochastotnoy oblasti)

PERIODICAL: Sb. statey nauch. -stud. o-va Mosk. energ. in-ta (Collection of articles of the Scientific Student Society, the Moscow Power-Engineering Institute), 1956, Nr 9, pp 142-147

ABSTRACT: A summary of fundamental results is presented of recently published experimental and theoretical works on the nature of the high (up to 10^6) ferrite permittivity in a low-frequency band. The high permittivity is explained by the presence in the material of relatively high conducting regions separated by the thinnest (of the order of 10^{-4} cm) interstices having high electric resistance. It is assumed that the origin of the interstices can be not only the porosity of the material or the presence of a second phase, but also defects in the crystal lattice at the points of contact between crystallites whose axes have different

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112-57-7-13954

On the Problem of Ferrite Permittivity in a Low-Frequency Band

orientations. Such defects result in an appearance of additional donor or acceptor levels and also in an increase in boundary-layer resistance, similar to the role of p-type interstices in n-type germanium. Bibliography: 14 items.

B.A.F.

Card 2/2

FRUMKIN, A. L.

AUTHORS: Valeyev, Kh. S., Drozdov, N. G., Frumkin, A. L. 57-11-14/33

TITLE: Some Studies on Li-Zn-Ferrites (Nekotoryye issledovaniya v oblasti Li-Zn ferritov)

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol. 27, Nr 11, pp. 2517-2527 (USSR)

ABSTRACT: The sintering process as well as some properties of Li-ferrites which are of importance as high-frequency materials as well as objects for physical investigations, are investigated. The investigation of the sintering process was mainly carried out according to the thermogram method. By means of the thermograms conclusions were drawn as to the temperature at which ferrites form, the interaction of ferrites and the atmosphere during annealing etc. A comparative classification of Li- and Ni-ferrites is given. The authors show that Li-ferrites are better capable of reaction than are Ni-ferrites. The reaction for the formation of the solid solution begins immediately after the thermal decomposition of lithium carbonate at 700°C and ends in a narrow temperature interval. The reaction temperature depends on the ratio of the components to one another. The interaction between ferrites and atmosphere during annealing was stated. It leads to the reversal loss of oxygen. The authors show that sintering above the temperature of synthesis is connected with the growing of the crystals as well

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Some Studies on Li-Zn-Ferrites.

57-11-14/33

as with the formation of their regular hexagon structure. The results of magnetic measurements show that Li-Zn-Ferrites show a dispersion of the resonance type within the range of 10^7 cycles. The authors stated that the magnetic permeability of the ferrites investigated is smaller than 1 at a wave length of 3,2 cm. Li-Zn-ferrites supply the usual absorption curve in dependence on the constant magnetic field in the case of high frequency. The thermal extension of the Li-Zn-ferrite within a wide temperature range was investigated and an anomaly was found in the near of the Curie point with the extension in consequence of heat. There are 9 figures, 3 tables and 12 Slavic references.

ASSOCIATION: Moscow Institute for Energetics (Moskovskiy energeticheskiy institut)

SUBMITTED: December 30, 1956

AVAILABLE: Library of Congress

Card 2/2

~~16~~
24,2200

25787
S/048,61/025/005/001/024
B104/B201

AUTHORS: Polivanov, K. M. and Frumkin, A. L.

TITLE: Thin magnetic films in modern physics and technology

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,
v. 25, no. 5, 1961, 566-568

TEXT: The present investigation was the subject of a lecture delivered at a symposium on thin ferromagnetic films (Krasnoyarsk, July 4 to 7, 1960). The thin magnetic films consist here of ferromagnetic substances about 10^3 Å thick. These magnetic films differ as to their magnetic properties from massive magnets: (1) they possess, in their thickness, only one domain at a time, with the magnetization vector always lying in their plane under static conditions; (2) the demagnetization factor of the films in their plane is exceedingly small (in the range from 10^{-4} to 10^{-5}) and equal to unity in the direction of the normal; (3) eddy currents are absent in the films up to super-high frequencies; (4) because of the particular domain structure the ferromagnetic resonance of the

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Thin magnetic films in modern ...

films is by 10 to 100 times higher than that of the massive magnets; correspondingly, a high permeability is conserved at high frequencies; (5) the films exhibit a very high rate of magnetic reversal with pulsed and sinusoidal alternating fields, with the losses being very low; (6) many films exhibit in their plane a very pronounced magnetic anisotropy; (7) many films display a rectangular hysteresis loop. The development of nonmetallic ferromagnetic substances (ferrites) is dealt with, and two important tendencies of this development are indicated. One serves the purpose of obtaining ferromagnetic substances of an extremely high resistivity. The other is for producing the thinnest possible ferromagnetic materials. In both cases, the absence of eddy currents plays an essential part. Owing to the domain structure that is characteristic of magnetic films, and to the magnetization dynamics, novel possibilities of their application in research and in the industry arise. Due to the circumstance that the substance in such a magnetic film appears in a "two-dimensional" state, one of these dimensions being considerably smaller than the other, possibilities of application arise, e.g., in the study of spin waves in films or of the direct voltage appearing at the ends of the film on the incidence of a shf energy. Of great interest for the theory

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Thin magnetic films in modern ...

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of solids is the study of the action of a magnetic field upon the film during its formation, whereby a uniaxial anisotropy is caused. The most important technical application is in high-speed computers. A special, but very promising application of magnetic films, is possible in devices working by the principle of parametric excitation. Due to the relatively low magnetic fluxes of magnetic films their use in radio engineering meets with some difficulties, and it is first necessary to find solutions for the diminution of the air inductances and other problems. The use of printed circuits and film transistors appears to be promising. The films are produced by vacuum evaporation or by electrodeposition. An improvement of production methods or the development of entirely new methods is possible. Permalloy magnetic films are used most today; Mn-Bi films are being studied in various countries. There are 28 references: 8 Soviet-bloc and 20 non-Soviet-bloc.

Card 3/3

FRUMKIN, A.L.

Measurement of small inductance changes by means of a Q-meter.
Izv. vys. ucheb.; radiotekh. 5 no.1:91-96 Ja-F '62. (MIRA 15:5)

1. Rekomendovana kafedroy teoreticheskikh osnov elektrotehniki
Moskovskogo ordena Lenina energeticheskogo instituta.
(Inductance—Measurement)

24,2200

(1147, 1164, 1482)

34178

S/048/62/026/002/027/032

B117/B138

AUTHOR: Frumkin, A. L.

TITLE: Theoretical study of the permeability of thin anisotropic magnetic films

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya. v. 26, no. 2, 1962, 299-303

TEXT: This paper was presented at a conference on magnetism and antiferromagnetism. Permeability was calculated on the assumption of uniform rotation. The equations

$$H_c \sin \varphi \cos \varphi - H_0 \sin (\alpha - \varphi) - H_{\text{test}} \sin (\beta - \varphi) = 0 \quad (1)$$

and
$$\kappa = J \left[\frac{\partial \cos (\beta - \varphi)}{\partial H_{\text{test}}} \right] = J \sin (\beta - \varphi) \left(\frac{\partial \varphi}{\partial H_{\text{test}}} \right) \quad (2)$$

were suggested from the common solution of which the differential susceptibility of the film can be determined for any amount and direction of magnetizing field H_0 and for any direction of test field H_{test}

H_c is the coercive force of the rotation of the film, $H_c = 2K_k/J$; φ is the

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Theoretical study of the...

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B117/B138

angle between the direction of magnetization of the film and the axis of easy magnetization; α and β are the angles formed by H_0 and H_{test} respectively with the axis of easy magnetization. Analysis of the solutions obtained for the simplest cases showed that at a certain direction and amount of the fields acting upon the film the differential susceptibility may exceed the amount of J/H_0 . Factors are studied that may cause the experimental data to deviate from the values calculated on the basis of a model with uniform rotation. Up to frequencies of the order of 10^7 the permeability is not necessarily influenced by effects related with the finite velocity of rotation of the magnetization vector as the natural frequency of ferromagnetic resonance of the films is sufficiently high (10^9 cps). Eddy currents effects can be only observed in the range of superhigh frequencies or with pulsed magnetic reversal in strong fields. Inhomogeneities may, of course, influence the course of the curve $\mu(H_0)$. This problem has hardly been investigated to date. The possibility of the formation and variation of a domain structure is of much greater importance. In films in the remanent state, which can be regarded as consisting of one domain only the experimental and theoretical values are in agreement. In

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B117/B138

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films with domains in which magnetic reversal is caused by a displacement of the domain boundaries, permeability may deviate considerably from that calculated for weaker fields (lower than the coercive force). In strong fields no considerable change is to be expected. It is found that calculation of the permeability of films on the basis of the uniform rotation model is simple and explains the anisotropy of the permeability of films. Such a calculation gives information on the magnetic properties of films, especially on the relationship between their initial permeability and frequency of free ferromagnetic resonance. There are 1 figure and 8 references: 4 Soviet and 4 non-Soviet. The three references to English-language publications read as follows: Smith D., J. Appl. Phys., 29, 264, Suppl. (1958); Soohoo R., J. Appl. Phys. 31, 218, Suppl. (1960); Dietrich W., Proebster W., Wolf P., IBM Journ. 4, 189 (1960)

ASSOCIATION: Kafedra teoreticheskikh osnov elektrotekhniki Moskovskogo energeticheskogo instituta (Department for Theoretical Principles of Electrical Engineering of the Moscow Power Engineering Institute) ✓

Card 3/3

40672

S/126/62/014/002/002/018
E032/E514

24,2900

AUTHORS: Polivanov, K.M. and Frumkin, A.L.
TITLE: Differential susceptibility of thin magnetic films
with uniform rotation of the magnetization
PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.2, 1962,
165-171

TEXT: The aim of this work was to calculate the susceptibility of films with arbitrary anisotropy under static conditions in the presence of a sinusoidal test field. The calculations are confined to the case of uniformly magnetized film, and are illustrated in the figure. It is required to calculate the susceptibility with respect to the test field H_{\perp} when in addition to this field there is also a constant arbitrary field H_0 . Suppose that H_0 and H_{\perp} are at angles α and β to the direction of easy magnetization. It is assumed that the magnetic anisotropy energy E_a is known as a function of the angle φ between the direction of easy magnetization and the magnetization vector I . When the test field H_{\perp} is very small, the susceptibility $\chi = dI_{\perp}/dH_{\perp}$ is given by

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Differential susceptibility ...

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E032/E514

$$\chi = I^2 \frac{\sin^2(\beta - \varphi_0)}{\left. \frac{d^2 E}{d\varphi^2} \right|_{\varphi=\varphi_0}} \quad (6)$$

where dI_{\parallel} is the increase in I in the direction of H_{\parallel} due to dH_{\parallel} , φ_0 is the equilibrium value of φ which is determined by the anisotropy and the constant magnetic field and E is the magnetic energy of the film due to both the anisotropy and the external field. The analysis is then confined to films whose anisotropy may be described by $E_a = K \sin^2 \varphi$ (7). The above expression for the susceptibility holds only when the angle φ does not lie in the neighbourhood of points for which

$$\frac{d^2 E_a}{d\varphi^2} + I H_0 \cos(\alpha - \varphi) = 0, \quad (5)$$

In the general case the expression for χ is somewhat more complicated. Subject to this restriction the so-called reduced susceptibility, i.e. the susceptibility divided by $I^2/2K$, turns out to be

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Differential susceptibility ... S/126/62/014/002/002/018
E032/E514

$$\chi_{np} = \frac{\sin^2(\beta - \varphi_0)}{\cos 2\varphi_0 + h_0 \cos(\alpha - \varphi_0)} \quad (8)$$

where $h_0 = H_0/2K$. When Eq.(5) is satisfied it is found that for small φ_0 values of the test field

$$\sin \varphi_0 \cos \varphi_0 - h_0 \sin(\alpha - \varphi_0) = 0 \quad (9)$$

In general, φ_0 cannot be determined analytically from this result but graphical methods are possible and hence a numerical determination of the susceptibility of films with anisotropy given by Eq.(7) is always possible for any orientation of the magnetizing and test fields. The second part is concerned with the complex susceptibility in the radiofrequency range. Using an expression given by D. O. Smith (J. Appl. Phys., 1958, 29, 264) for the free motion of the magnetization vector, an expression is obtained for the complex susceptibility in a sinusoidal test field and this is then applied to films for which Eq.(7) holds. There is 1 figure.

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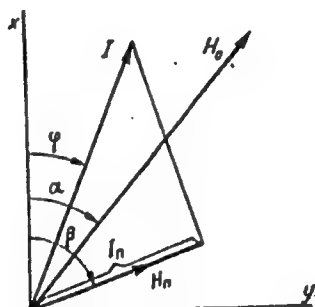
Differential susceptibility ...

S/126/62/014/002/002/018
E032/E514

ASSOCIATION: Moskovskiy energeticheskiy institut
(Moscow Power Engineering Institute)

SUBMITTED: February 19, 1962

Figure



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34179

S/048/62/026/002/028/032
B117/B138

24,2200 (1147,1164,1482)

AUTHOR: Frumkin, A. L.

TITLE: Experimental study of the permeability of anisotropic magnetic films at radiofrequencies

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 2, 1962, 303-305

TEXT: This paper was presented at a conference on magnetism and antiferromagnetism. To find the permeability of a film, it was made to act as the core of a coil and measurements were made of the changes in the complex resistance of the coil caused by it. The coil was wound on to a base with the film or on to a flat frame into which the specimen was introduced with minimum clearance. The true and the imaginary parts of the permeability of the film are: $\mu_1 = \Delta L / \eta w_0^2 S d$ and $\mu_2 = \Delta R / \eta \omega w_0^2 S d$. ΔL and ΔR are the changes in inductance and active resistance of the coil due to the film; w_0 is the number of turns per unit length; S is the plane surface area of the film; d is the thickness of the film; ω is the angular frequency of the

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Experimental study of the...

reference current; η depends on the units chosen and on the geometrical dimensions of the coil. ΔL and ΔR were measured by a Q-meter by a special method (Ref. 1: Polivanov, K. M., Frumkin, A. L., Tr. nauchno-tekhnich soveshch. po metodam i apparature dlya ispytaniya magnitnykh materialov (transactions of scientific and technical conferences on methods and apparatus for testing magnetic materials (1961)). The author studied the Ni-Fe etc. films magnetized by a 200-oe field along the axis of easy magnetization. The data obtained showed good qualitative agreement with the theory which is based on the concept of a uniform rotation of the magnetizing intensity vector. With $\alpha = 0$, $\beta = 90^\circ$ permeability, as a function of field, follows the hyperbolic law. With antiparallel I and H permeability increases as predicted by the theory. In the range of weak fields (lower than the coercive force) deviations from the theory are observed that are apparently caused by boundary migration. With magnetic reversal along the axis of easy magnetization the experimental values are often lower than when a field is applied in the remanence direction. For intensification and weakening of the magnetizing field which is applied along the axis of the most difficult magnetization the $\mu(H_0)$ curves do not agree. Under certain conditions marked magnetic losses occur. The nature

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Experimental study of the...

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of which is not clear. Further studies are necessary for a detailed analysis of the experimental data and for their comparison with the theory. The author thanks K. M. Polvanov for advice. There are 3 figures and 2 Soviet references.

4

Card 3/3

KOLLI, Ya.N.; FRUMKIN, A.I.

Concerning the accuracy of a resonance method for measuring small variations of capacitance and inductance. Izv.vys.ucheb.zav.; radiotekh. 5 no.5:646-648 S-0 '62. (MIRA 15:11)

1. Rekomendovano kafedroy teoreticheskikh osnov elektrotekhniki Moskovskogo ordena Lenina energeticheskogo instituta.
(Inductance—Measurement) (Electronic measurement)

POLIVANOV, K.M.; FRUMKIN, A.L.

Methods of investigating the magnetic properties of thin magnetic films
in static and quasi-static conditions. Trudy inst. Kom.stand.mer
i izm. prib no.64:278-288 '62. (MIRA 16:5)
(Magnetic measurements—Equipment and supplies)

FRUMKIN, A. L.

" A Theoretical and Experimental Study of the Permeability of Anisotropic Thin Magnetic Films."

Dissertation for the degree of Doctor of Technical Sciences
defended at the Moscow Power Engineering Institute, March 1963.

Moscow, Elektrichestvo, No. 9 Sent pp 94-95.

L 17115-63

EW(1)/EW(p)/EW(m)/BDS AFPTC/ASD CG/JD

ACCESSION NR: AP3002843

S/0126/63/015/006/0846/0853

AUTHORS: Polivanov, K. M.; Frumkin, A. L.

TITLE: Measurement of magnetic moment in thin magnetic films by the torsional vibration method

SOURCE: Fizika metallov i metallovedeniye, v. 15, no. 6, 1963, 846-853

TOPIC TAGS: magnetic moment, thin film, torsional vibration method

ABSTRACT: The magnetic moment in thin films has been measured by using the Gauss torsional vibration method which makes it possible to determine the absolute value of the moment and provides for the investigation of arbitrary magnetization curves under static conditions. The problem was formulated as follows: a film placed on a plate is suspended on a thread so that the plane of the film is vertical. A magnetic field H acts in the horizontal plane and is directed along the film in a static equilibrium. The equation for free torsional oscillations of the film around the thread is:

$$K\ddot{\alpha} + P\dot{\alpha} + MH\sin(\alpha - \gamma) + C\alpha = 0, \quad (1)$$

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ACCESSION NR: AP3002843

where K is the moment of inertia of the sample with respect to the thread, α is angle of the sample's declination from the static equilibrium position, P is attenuation coefficient, γ is the angle at which the vector M declines from the film under the action of H at given α , and C is the elastic constant of the thread. The formulas for the natural sample oscillations, for the magnetic moment, and for the evaluation of relative sensitivity toward the field variation are derived. The authors conclude that the torsional vibration method is the simplest and the most accurate method for the determination of magnetic moment and static magnetization curves of thin films. Orig. art. has: 7 formulas and 3 figures.

ASSOCIATION: Moskovskiy energeticheskii institut (Moscow Power Engineering Institute)

SUBMITTED: 30Oct62

DATE ACQ: 23Jul63

ENCL: 00

SUB CODE: ML, PH

NO REF SOV: 008

OTHER: 013

Card 2/2

POLIVANOV, K.M.; FRUMKIN, A.L.; KHERSONSKIY, M.S.

Hysteresis loops of thin magnetic films with a "negative" area.
Fiz. met. i metalloved. 19 no.4:506-513 Ap '65.

(MIRA 18:5)

1. Moskovskiy energeticheskiy institut.

L 3108-66 EWT(d)/ENT(m)/ENP(1)/ENP(c)/ENP(v)/I/ENP(t)/ENP(k)/ENP(h)/ENP(b)/ENP(l)
 ACCESSION NR: AP5026358 JU UR/0105/64/000/009/0094/0095

AUTHOR: Tsvetkov, V. A.; Birzniek, L. V.; Vysochanskiy, V. S.; Shakhnazaryan, Yu. M.; Kazanskiy, V. Ye.; Kapuntsov, Yu. D.; Salekh, M. A. Kh.; Prumkin, A. L.; Bakhovtsov, B. A.

TITLE: Dissertations in competition for the academic degree of doctor of technical sciences

SOURCE: Elektrichestvo, no. 9, 1964, 94-95

TOPIC TAGS: electric engineering, electric power engineering, electric equipment, electric distribution equipment, electric rotating equipment, automatic control, automatic control system

Abstract: The following defended dissertations at the Moscow Power Engineering Institute: V. A. TSVETKOV, 14 December 1962, on the theme "Autoparamagnetic Phenomena and Surges in Three-Phase Circuits which Contain Ferromagnetic Equipment," his official opponents -- Doctor of Technical Sciences, Professor V. A. TAPT and Candidate of Technical Sciences, Lecturer L. F. DIOKHOVSKAYA; L. V. BIRZNIYK, 4 January 1963, on the theme "Electromagnetic Processes in Multistage Voltage Regulation Circuits in Electric

Card 1/4 *NOT AUTHOR'S OF ARTICLE

L 3108-66

ACCESSION NR: AP5026358

Rolling Stock with Semiconductor Rectifiers," his official opponents -- Doctor of Technical Sciences B. N. TIKHOMENOV and Candidate of Technical Sciences, Lecturer L. M. TRAVHTMAN, V. S. VYSOCHANSKIY, 18 January 1963 on the theme "Methods for Controlling the Strip Tension at the Reel of a Cold Rolling Mills," his official opponents -- Doctors of Technical Sciences K. P. KUNITSKIY and N. N. DRUZHININ; Yu. M. SHAKHNAZARYAN, 18 January 1963, on the theme "Approximate Methods for Analysis of Non-Stationary Asynchronous Conditions in Electrical Systems," his official opponents -- Doctor of Technical Sciences, Professor L. G. MANIKONYANTS and Candidate of Technical Sciences, Lecturer N. I. GOKOLOV; V. Ye. KAZANSKIY, 18 January, on the theme "Some Problems in Automation and Remote Control of Power Systems," his official opponents -- Doctor of Technical Sciences, Professor I. A. SYROMYATNIKOV and Candidate of Technical Sciences V. K. SPIRIDONOV; Yu. D. KAPUNTISOV, 18 January 1963, on the theme "An Asynchronous Electric Drive with Non-Symmetric Connection of the Saturation Chokes in the Stator Circuit," his official opponents -- Doctor of Technical Sciences V. Ye. BOGOLYUBOV and Candidate of Technical Sciences, Lecturer D. M. LIPATOV; M. A. Kh. BALEKH, 22 February 1963, on the theme "Theoretical Study of the Operation of Miniature Two-Phase Asynchronous Machines when the Supply Voltage is not Sinusoidal," his official opponents -- Doctor of Technical Sciences, Professor A. I. BERTINOV and Candidate of Technical Sciences,

Card 2/4

L 3108-66

ACCESSION NR: AP5026358

Lecturer P. Yu. KAASIK; A. L. FRUMKIN, 8 March 1963, on the theme "A Theoretical and Experimental Study of the Permeability of Anisotropic Thin Magnetic Films," his official opponents -- Doctor of Physical and Mathematical Sciences, Professor R. V. TELESNIN and Candidate of Technical Sciences, Lecturer P. P. MESYATSEY; B. A. BAKHOVTSOV, 19 April 1963, on the theme "Synthesis of Systems for Automatic Control of Starting and Stopping of Electric Drives," his official opponents -- Doctor of Technical Sciences, Professor A. S. HANDLER and Candidate of Technical Sciences, Lecturer Yu. Ye. NITUSOV. At the Moscow Higher Technical Academy (MVTs) Bauman -- G. A. MIKONOV, 10 December 1962, on the theme "A Method for Experimental Programming of Electronic Digital Computers," his official opponents -- Doctor of Physical and Mathematical Sciences, Professor L. A. LYUSTERNIK and Candidate of Technical Sciences, V. Ya. PETROV. At the All-Union Electrotechnical Institute im. Lenin -- V. A. VOL'KENAU, 11 December 1962, on the theme "Conductivity of Carborundum," his official opponents -- Doctor of Technical Sciences, Professor V. V. BURGSDORF and Candidate of Technical Sciences, D. V. BHISHMAN. At the Academy of Municipal Economy im. Panfilov -- V. A. KOZLOV, 14 January 1963, on the theme "Problems in the Use of Closed Systems for Municipal Electrical Networks," his official opponents -- Professor P. G. GRUDINSKIY and Candidate of Technical Sciences, Lecturer F. F. VORONTSOV.

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L 3108-66

ACCESSION NR: AP5026358

At the All-Union

Scientific Research Institute of Electromechanics -- L. Ya. STANISLAVSKIY, 23 November 1962, on the theme "On Work in the Field of High Power Turbo-Generators and Hydrogenerators," his official opponents -- Doctor of Technical Sciences, Professor I. M. POSTNIKOV, Doctor of Technical Sciences I. D. URUSOV and Candidate of Technical Sciences Yu. M. EL'KIND.

Research Institute of Railroad Transportation: Y. D. TULUPOV, 21 December 1962, on the theme "Development and Investigation of a System for Automatic Control of Rheostat Braking of Rectifier Electric Locomotives," his official opponents -- Doctor of Technical Sciences B. N. TIKHOMENY and Candidate of Technical Sciences B. G. KAMENETSKIY; V. D. MONTSEV, 21 December 1962, on the theme "Protection of Traction Motors from Short Circuit Currents During Regenerative Braking," his official opponents -- Doctor of Technical Sciences, Professor V. Ye. ROZENFEL'D and Candidate of Technical Sciences L. M. TRAPHTMAN; A. V. KAMENEV, 11 January 1963, on the theme "Study of Voltage Control Systems for Power Transformers in AC Electric Locomotives with Rectifiers," his official opponents -- Doctor of Technical Sciences, I. P. ISAYEV and Engineer Kh. Ya. BYSTRITSKIY.

ASSOCIATION: none

SUBMITTED: 00

NO REF SOV: 000

Card 4/4 SC

ENCL: 00

OTHER: 000

SUB CODE: EE, IE

JPRS

L 20736-66 EWT(d)/EWT(1)/EWT(m)/EWP(1)/EWP(t) IJP(c) GG/BB/JD

ACC NR: AP6011997

SOURCE CODE: UR/0126/65/019/004/0506/0513

AUTHOR: Polivanov, K. M.; Frumkin, A. L.; Khersonskiy, M. S.

ORG: Moscow Power Engineering Institute (Moskovskiy energeticheskiy institut) 33

TITLE: Hysteresis loops of thin magnetic films with 'negative' area 33

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 4, 1965, 506-513

TOPIC TAGS: hysteresis loop, magnetic thin film, magnetic circuit

ABSTRACT: When a thin magnetic film is acted upon by mutually perpendicular fields, a hysteresis loop can be formed with "negative" area. This phenomenon is analyzed on the basis of a model of homogeneous rotation. For small amplitudes of the alternating components of the fields an analytic calculation is performed for the area of the loop; and expressions are produced for this area, the power of the circuit, and the tangent of the angle of magnetic losses. All three quantities are negative, indicating a reverse flow of power. Under static conditions, experimental negative loops are produced which are in qualitative agreement with the theory. The expressions obtained for loop area, power, and u_2 are:

$$S = -\frac{B_s H_k \pi}{2} h_{jm}^3 \cdot h_{sm}$$

$$P = \frac{1}{2\pi} S = -\frac{B_s H_k}{4} h_{jm}^3 \cdot h_{sm}$$

Card 1/2

UDC: 538.23

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and $\mu_1 = -\frac{B_s}{2H \mu_0} \cdot h_{sm}$ respectively. Orig. art. has: 7 figures and 2 formulas.

[JPRS]

SUB CODE: 20 / SUBM DATE: 06Apr64 / ORIG REF: 003 / OTH REF: 003

Card 2/2

L 25899-66 EWT(1)/T IJP(c) GG

ACC NR: AP6010402

SOURCE CODE: UR/0126/66/021/003/0367/0373

AUTHORS: Polivanov, K. M.; Frumkin, A. L.

ORG: Moscow Power Institute (Moskovskiy energeticheskiy institut)

TITLE: The effective permeability of thin magnetic films as a function of the amplitude of a radio-frequency field

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 3, 1966, 367-373

TOPIC TAGS: magnetic permeability, permeability measurement, permalloy, oscillator, hysteresis loop, magnetic hysteresis, magnetic moment, rf field/ GSS-6 oscillator

ABSTRACT: The complex permeability of permalloy films as a function of the amplitude of a radio-frequency field at frequencies on the order of 10^6 Hz is studied. The method of radio-frequency measurements differed little from that described earlier by K. M. Polivanov and A. L. Frumkin (Tr. Komiteta standartov, mer i izmeritel'nykh priborov, No. 64 (124), M-L., Standartgiz, 1962, p. 278). The resonant circuit was powered by a GSS-6 oscillator. The standard specimen of 80-20 permalloy had a thickness of 1040 \AA . An increase in the real and imaginary parts of the permeability as a function of field strength was observed (see Fig. 1). The radio-frequency losses were proportional to the area of the static hysteresis loop (see Fig. 2). It is concluded that in the phenomenological dynamic equation of magnetization of the film the coefficient taking attenuation into account is a function of the angle of

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UDC: 539.216.2:538.213

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ACC NR: AP6010402

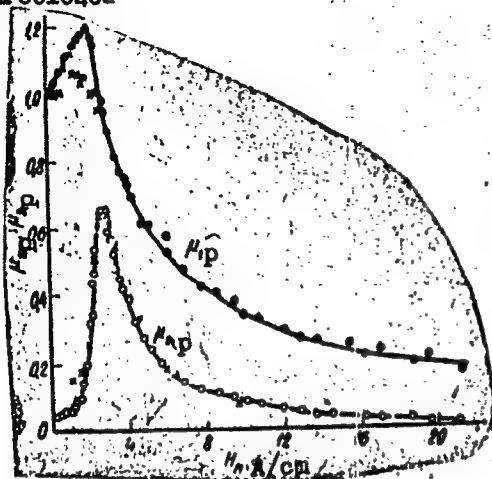


Fig. 1. Real μ_{1p} and imaginary μ_{2p} parts of complex permeability of permalloy film as a function of strength of alternating field acting along transverse axis. Superposed magnetizing field absent. Frequency 1.5 MHz. X--values of μ_{1p} and μ_{2p} calculated on basis of static measurements. Values of μ_{2p} obtained from statics are multiplied by 5.6.

deviation. The authors thank I. A. Miroshnik for aid in aligning the measuring circuit and students O. V. Korobkov and V. Ye. Aleksandrov for aid in the measurements.

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ACC NR: AP6010402

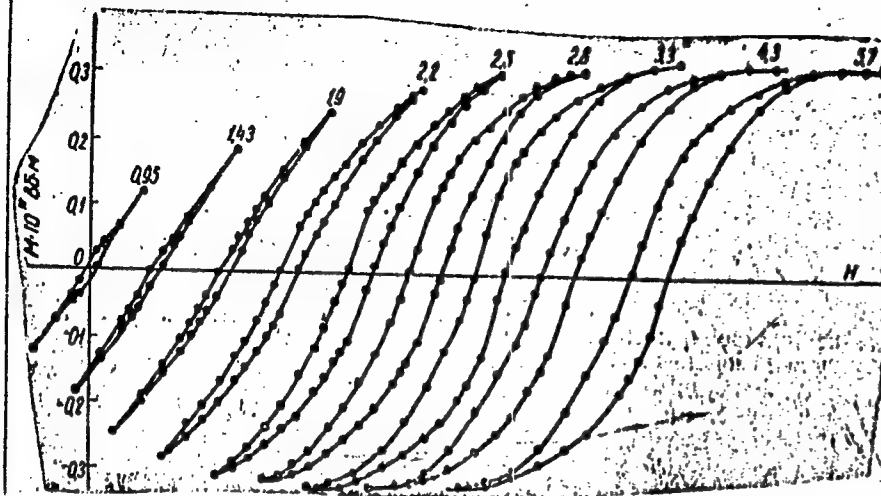


Fig. 2. Static hysteresis loops of film in transverse direction in the absence of superposed magnetization. The numbers indicate the field strength in A/cm. For each loop, the origin for reading H is at its center. M is the magnetic moment of the film.

Orig. art. has: 7 graphs and 1 formula.

SUB CODE: 09, 20/

SUBM DATE: 10 May 65/

ORIG REF: 007/

OTH REF: 009

Card 3/3 BLC

FRUMKIN, A.L.

Measurement of reactances connected with a Q-meter by a line with distributed parameters. Prib.i tekhn.eksp. 6 no.5:135-138 S-0 '61.
(MIRA 14:10)

1. Moskovskiy energeticheskiy institut.
(Electric measurements)

FRUMKIN, A.N., akademik

Adsorption of organic substances as dependent on the electrode of hydrogen-
adsorbing metals. Dokl. AN SSSR 154 no.6:1432-1433 F '64.

(MIRA 17:2)

CZECHOSLOVAKIA

FRUMKIN, A.N.; MANSUROV, G. N.; KAZARINOV, V.E.; BALASHOVA, N. A.

Electrochemical Institute, Soviet Academy of Sciences (Institut elektrokhemii, Akademiia nauk SSSR), Moscow (for all)

Prague, Collection of Czechoslovak Chemical Communications, No 2, Feb 1966, pp 806-813

"Study of the adsorption of cadmium cations on a platinum electrode."

FRUMKIN, A., GORODETSKAYA, A. AND KABANOV, B. and NEKRASSOV, N.

"Capillary Electric Phenomena and the Wetting of Metals by Electrolyte Solutions. Physikal. Z. Soviet Union, 1932, 1, 255-285

The relation between the p.d. solution /Hg and the contact angle of the three-phase lines solution - Hg-gas and solution - Hg-oil is discussed. The applicability of Neumann's equation to the former system is vitiated by the presence of an adsorbed film of H_2O containing electrolyte between the Hg and a gas bubble. The readiness of wetting of surfaces of Ag and of PbS by solutions is increased by cathodic polarisation.

ca

Influence of the kinetics of ethylene adsorption by the platinum content of activated carbon. R. BURSTEIN AND A. FRUMKIN. *Physik. Z. Sowjetunion* 2, 194-4 (1932).—Adsorption of C_2H_4 by activated sugar C proceeds more rapidly on C containing 0.2% Pt than on Pt-free C but the equil. pressure is the same. The extent and character of the effect depend very greatly upon the prepn. of the C. H. STUART

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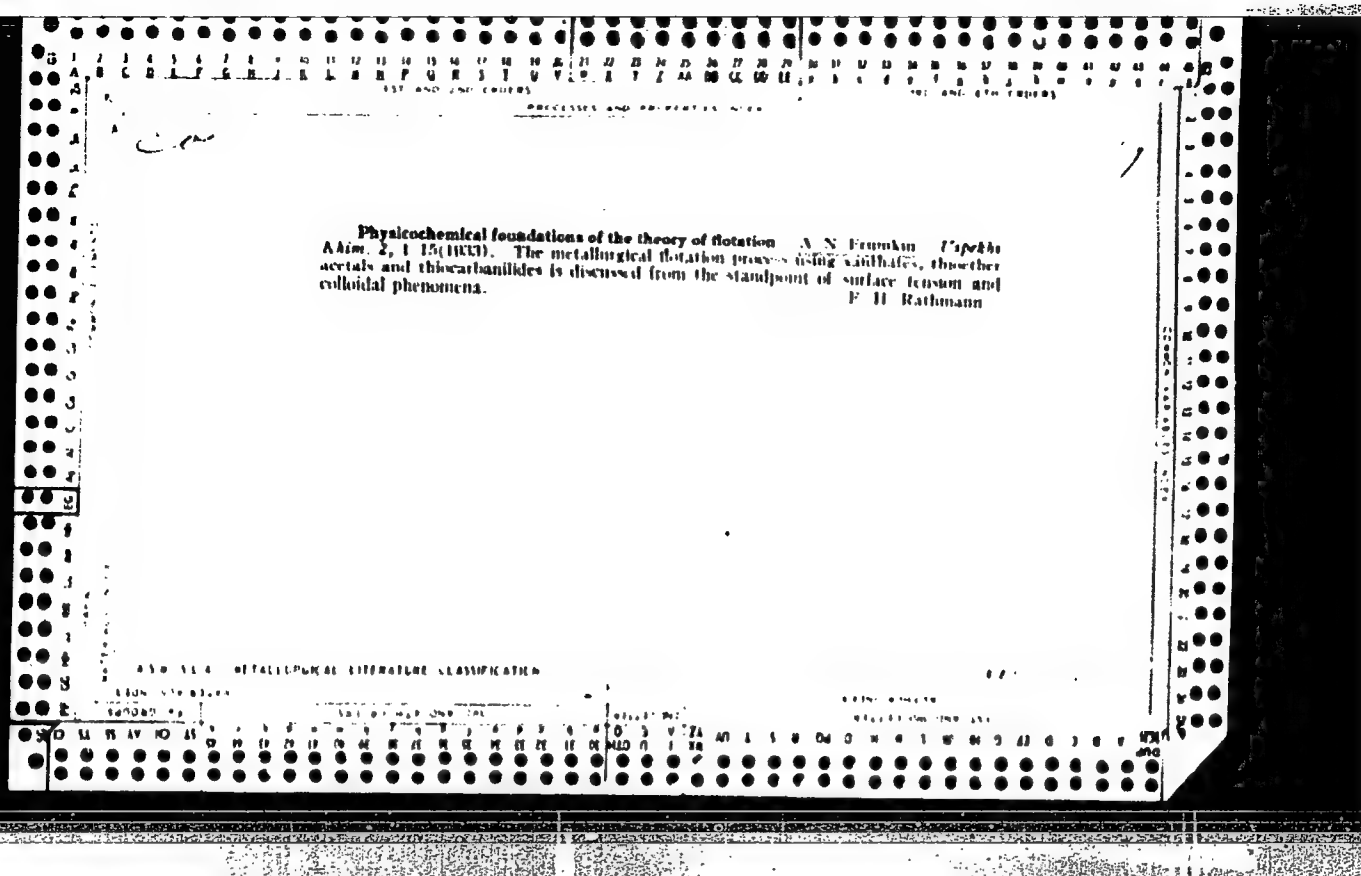
ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION

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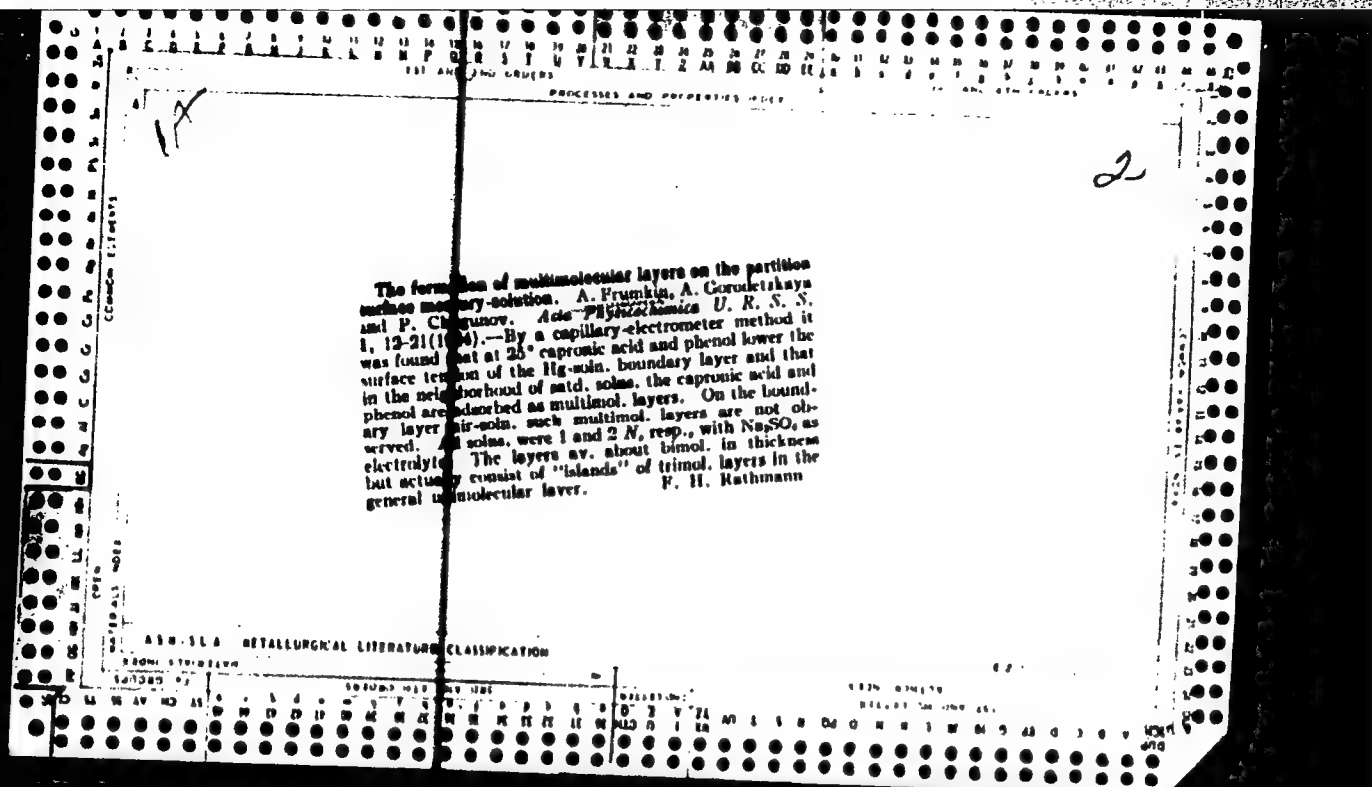
ADSORPTION OF HYDROGEN ON PLATINIZED CHARCOAL. P. BURSTEIN AND A. FRUMKIN.
J. Phys. Chem. (U. S. S. R.) 3, 108-7(1962).—The rate as well as the amt. of adsorption of H₂ is increased many fold as the temp. is raised from 25° to 500°, the greatest increase coming above 300°. P. H. KATHMANN

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ASAC-SLA DETAILING LITERATURE CLASSIFICATION
UNCLASSIFIED



COMMON ELEMENTS										PROCESSES AND PROPERTIES INDEX									
<p>OK</p> <p>Ion adsorption on metals and charcoal. A. Frumkin; Physik. Z. Sowjetunion 4, 219-61(1933).--A review. L. E. Steiner</p>										<p>2</p>									
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
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Maxima of the polarization curves of mercury cathodes
A. Frumkin and B. Bruns. *Acta Physicochim. U. R. S. S.* **3**
1947, 232-36 (1947) (in German).—A polarization cell consisting of a Hg drop, surface 0.3 sq. cm., as cathode and a large Hg surface as anode in a HNO_3 -Hg(NO₃)₂ soln. was used. On slowly raising the applied voltage up to 2 v., the current rises linearly, passes through a max. at about 2.0 v., then decreases up to 2.65 v. and again suddenly rises. On lowering the voltage, hysteresis is obtained; below 1.8 v. the current drops strongly, is 0.8×10^{-4} at 1.6 to 1.4 v. and then again increases slowly with an upward jump at 0.4 v. On the increasing voltage curve and especially for low concn. of the soln., the current is transported almost exclusively by Hg_2^{++} ions. The results are explained on the basis of a theory resting on the assumption of a primary process of charging-up of the double layer.
F. H. Rathmann

F. H. Rothmann

ASB-114 METALLURGICAL LITERATURE CLASSIFICATION

Phase-boundary forces at the boundary gas liquid. V. Halogen-substituted aliphatic acids. S. Iola, A. Yumkin and P. Chugunov. *Acta Physicochim. U. R. S. S. I.*, 883-900(1934)(in German).—The potential differences are plotted against concns. for propionic acid (I), α -chloro (II), α -bromo (III), α -iodo (IV), β -chloro (V) and β -iodo (VI)-propionic acids, butyric acid (VII), α -chloro (VIII), β -bromo (IX), δ -chloro (X) and γ -chloro (XI)-butyric acids. For I and VII, the p. d. rises sharply with increased concn.; with II, VIII and IX, p. d. rises and then gradually falls as concn. increases; for III, IV, V, VI and XI, p. d. is decreased as concn. increases. The neg. influence of the halogen is greater the farther it is removed from the carboxyl group, is less the longer the chain and is in the order $Cl > Br, I$. The surface tensions for the surface Hg-soln. are almost identical for α - and β -substituted propionic and butyric acids; this indicates that the mols. lie flat on the surface.

F. H. Rathmann

FRUMKIN, A. N. and KHLUIGIN, A.

"The platinum electrode." Compt. rend. acad. sci. URSS, 2, 173-6, 1934.
(in German 176-9)

An exptl. study was made of the capacity of the Pt electrode and the variation of the charge of the double layer with the electrode potential. The polarization curves show steps which are interpreted in terms of the various polarization and adsorption processes taking place at the electrode. Only the first 2 segments of the polarization curves are found to be reversible.

PROCESSING AND PROPERTIES INDEX																									
<p>Phase-boundary forces on the surface gas-liquid. VI. A new method of measuring potential difference on quiet surfaces. M. Gerovich and A. Frankin. <i>Acta Physico-chim.</i>, U. R. S. S. 2, 1-8(1948); cf. C. A. 21, 201.—The potential difference between a quiet liquid surface and air is measured by a modified Kenrich method; a horizontal jet of water across and above the liquid surface is used. It is used to study the potential distribution on the surface. The app. is described with a diagram. The results as obtained on an Et oleate film on a KCl soln. agree well with those obtained by a Po radioactive electrometer measurement. Results by the former method are more easily reproducible and show no variation with time. The distance between the surface and the horizontal beam should be 2 mm. and must be kept const. to ± 0.1 mm.</p>																									
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																									

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Affect of platinum on the adsorptive properties of charcoal in electrolyte solutions. S. Levina, A. Frumkin and A. Lunev. *Acta Physicochim. U. R. S. S.* 3, 387-412 (1935) (in German); *J. Phys. Chem. (U. S. S. R.)* 7 (in Press) (1933) (in Russian).—When platinized charcoal in a H₂ atm. is placed in a NaCl soln. it adsorbs NaOH but no Cl⁻, while in an O atm. HCl is absorbed and NaOH remains in soln. The same effects are obtained simply by shaking small pieces of smooth Pt metal with unplatinized charcoal. The charge of the Pt-H₂ electrodes formed locally is transferred over the whole charcoal surface producing H⁺ (or OH⁻) ions which then adsorb alkali or acid. The amount of adsorption is somewhat less than corresponds to the potential of the Pt-H electrode but increases again when more fresh Pt is added. Poisoning of the Pt is also indicated by its failure to act when added to a second sample of charcoal in salt soln. Similar effects are observed when Pt sols, platinized Pt, Pt black or platinized charcoal is added to unplatinized charcoal. In all cases the whole charcoal surface is recharged and no longer adsorbs acid from acid or salt solns. in a H₂ atm. while the unplatinized charcoal does so. This also explains why platinized charcoal adsorbs only acid in O or only alkali in H even though only a small fraction of the surface is Pt-covered. The dependence of the adsorption upon the Pt content of the charcoal is due to a lowering of the Pt-H potential as a result of partial poisoning of the Pt surface when the Pt content is small, and hence disappears for large Pt content.
F. H. Rathmann

ASB-56A METALLURGICAL LITERATURE
E-27

Processes and Properties of Solids
 The vapor pressure of small drops and crystals. A. I. Frumkin and N. Fuks. *Acta Physicochim. U. R. S. S. J.*, 783 (1935) (in German). A mol. kinetic equation, based on the classical capillarity theory of Kelvin for small liquid drops, was derived. For the case of very small, nonpolar crystals with simple cubic lattices, on the assumption that the attractive forces between the building stones of the lattice decrease with the 7th power of the distance, the correction to the Kelvin equation was calculated by the method of Kalschew and Stranski (C. I. 28, 2881 and 7128). In the case considered, this equation gives the correct order of magnitude of the vapor pressure down to crystals of the smallest possible size. R. R. R.

ASB-SLA METALLURGICAL LITERATURE

CLASSIFICATION

The platinum electrode. 1. The capacity of platinized platinum in different electrolytes and the electromotive behavior of adsorbed hydrogen. A. Shluigin and A. Prumkin. *Acta Physicochim. U. R. S. S. J.*, 701-818 (1955) (in German). The relation between the p. d. of the metal to the soln. of a platinized Pt electrode and the quantity of current sent through it was measured in the interval between the potential of the H electrode and an anodic polarization of about 1 v. in H_2SO_4 , HCl , KOH , HBr , Na_2SO_4 , $NaCl$ and $NaBr$. The electrode was satd. with H until it reached a const. potential, then the H was replaced with N. The potential was deid. against a normal electrode by the compensation method. Curves similar to those previously reported were obtained (C. A. 28, 1067). First there is a region in which desorption of the adsorbed H takes place, then a region of rapid change in potential (double-layer region), and finally oxidation of the electrode takes place. In alk. solns, the sepn. between the different parts of the curve is insignificant and the desorption of the H extends to the beginning of the oxidation. The capacity of the electrode (the quantity of electricity in coulombs consumed in the region in which desorption of H takes place) increases slowly with the quantity of Pt sponge. A limiting value for the capacity was not reached. Platinizing at high c. d. gave a black Pt which was not as highly dispersed as the gray Pt and did not have as high a capacity. The capacity decreases with time. From the form of the curves, the form of the

adsorption isotherm in the presence of electrolytes of H on Pt can be deduced. In acid solns, the quantity of adsorbed gas is directly proportional to the log of the gas pressure. The tenacity with which the H is held increases in the order $HBr < HCl < H_2SO_4 < KOH$. The possible significance of this relation to the structure of the adsorbed H layer is discussed.

F. R. Rushton
Calculation of the capacity of a lead storage battery by partial discharge to an optional terminal limit (stress end). The change of the capacity curve with temperature. 31. *Radi. Z. Elektrochem.* 42, 111-2; (1938); cf. C. A. 30,

2809. The capacity formula $C = \frac{C_{max}}{1 + a \exp \frac{U - U_0}{b}}$ is used in a graphic method to compute the capacity value by assuming a definite terminal voltage. The data and examples given indicate the effect of temp. change on the constants C_{max} and a , also the ease with which all capacities and voltage values can be calcd. for a given temp. change.

W. George Parks

ASB-31-A METALLURGICAL LITERATURE CLASSIFICATION

Ja

A 598

1772. Vapour Pressure of Small Drops and Crystals. A. Frumkin and N. Fuchs. *Acta Physicochimica*, 3 6 pp. 743-790, 1938
In German.—The Thomson equation for the vapour pressure of a liquid drop is obtained by application of molecular kinetic theory. The method of Kalschew and Stranaki is applied to determine the correction to this equation for very small homopolar crystals with simple cubic lattice, for which the attractive force between the lattices is assumed to decrease as the 7th power of the distance. For even the smallest possible crystal this leads to the conclusion that the Thomson equation gives the correct order of magnitude for the vapour pressure.
R. W. P.

ASS. SLA METALLURGICAL LITERATURE CLASSIFICATION

1831. Platinum Electrode. A. Siggia and A. Frumkin. *Acta Physicochimica*, 8. 6. pp. 791-818, 1934. In German.—The dependence of the p.d. metal/solution is investigated for a platinised Pt electrode. In solutions of H_2SO_4 , HCl , $NaOH$, HBr , Na_2SO_4 , $NaCl$ and $NaBr$. The p.d. is shown to depend upon the quantity of electricity passed in the region between the potential of the H electrode and anodic polarisation of about 1 V. The curves of potential and quantity of electricity passed show that in the case of anodic polarisation, the quantity of electricity passed is at first used in effecting a desorption of the adsorbed H_2 . This is followed by a rapid change of potential, and finally by oxidation of the electrode. The effects of different methods of platinising the electrodes upon the form of the curves are also determined. F. J. B.

FRUMKIN, A., and OBRUTSCHEVA, A.

"Potential of Platinum in Solutions of Silver Salts."

Compt. rend. Acad. Sci. URSS, 1936, 4, 11-13.

Bright Pt and Au in AgNO₃ solution exhibit the potential of Ag in a few min. (cf. A., 1934, 257). Small platinised electrodes behave similarly although a much longer time is required. In this case the potential is at first (in the acidified solution) more positive than the Ag potential and changes in a direction opposed to that expected by an adsorption of Ag. Ag crystals are formed when the electrodes reach the val. of the reversible Ag potential, especially in the case of the platinised electrodes. Large platinised electrodes give a change of potential in the same direction, but do not reach the value for the reversible Ag potential. When the large electrodes are agitated in the solution until a const. val. is reached the latter is no longer able to alter the potential of a new small electrode. A bright Pt electrode in this solution attained the Ag potential only after some hr. This sol. recovered its original properties after warming with Ag powder at 50° or after strong illumination for many hr. These effects are not due to Ag adsorption, but to a small amount of a reducing substance in the Ag solution. This substance reduced the acids chemically bound to the Pt surface and then the separation of Ag₂ results. A Ag ion of lower valency (Ag⁺) is suggested as the electrochemically active material.